

[ 2 ]

**Unit: A-4142**

3. a) What are PM<sub>2.5</sub> and PM<sub>10</sub> and how do they affect human health? 2
- b) How do you account for the formation of PAN in photochemical smog? 2
- c) Outline the principle for the estimation of SO<sub>2</sub> in an environmental sample? 3
- d) Discuss the principle and chemical reactions involved in Chemical Oxygen Demand (COD) analysis. 2
- e) What techniques are commonly used in desalination of water? 1
4. a) How do you identify (with chemical reactions) D-glucose using **Molisch**'s test? 2
- b) Mention the underlying principle for the determination of calcium and magnesium in milk sample using EDTA. 3
- c) How do you analyse the presence of nitrite as a preservative in food? 2
- d) What is **Karl Fischer** reagent? What is the principle of **Karl Fischer** titration? 2
- e) Write the reaction of an amino acid with ninhydrin reagent? 1

Ex/SC/CHEM/PG/CORE/TH/XIV-A/2023

**M. Sc. (CHEMISTRY) EXAMINATION, 2023**

(4th Semester)

**PAPER: XIV-A**

**[ ANALYTICAL CHEMISTRY SPECIAL ]**

Time : Two Hours

Full Marks : 40

(20 marks for each unit)

**Use a separate answer script for each unit.**

**Unit: A-4141**

1. a) What is meant by gel electrophoresis? What are the common types of gel electrophoresis? Explain the role of gel electrophoresis in separating bio-molecules. What are the advantages and disadvantages of gel electrophoresis? 6
- b) What is the principle of centrifugation? Is there any difference between centrifuge and ultracentrifuge? What is the application of ultracentrifuge in bio-analytical chemistry?
2. a) Schematically represent a spectrofluorimeter. 2
- b) Why are extrinsic fluorophoric units required? Give one example. 2
- c) Define different types of quenching mechanism. 2
- d) Why is resonance energy transfer (RET) mechanism important for characterization of biopolymers? 2
- e) Give examples of intrinsic chromophoric and fluorophoric units of biopolymers. 2

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